

Lewis Creek - 2017 Water Quality Summary
Addison County River Watch Collaborative

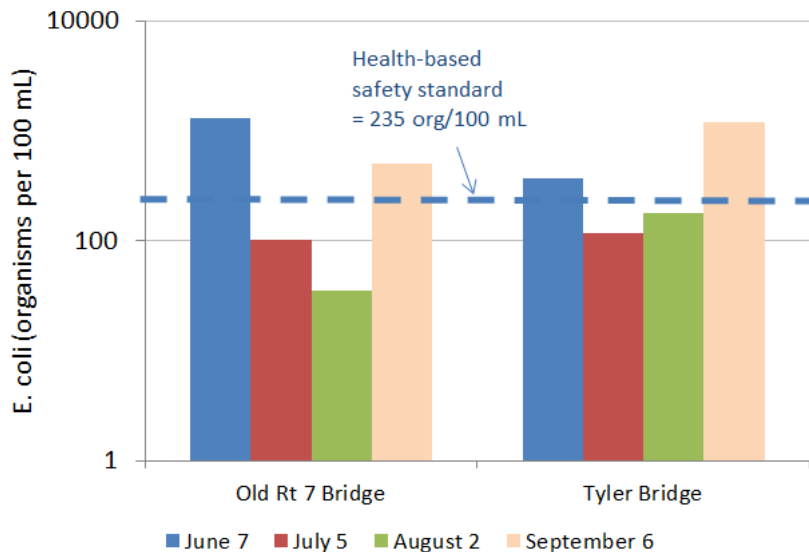
Site	Location	Town
LCR3.7	Old Route 7 Bridge	Ferrisburgh
LCR14	Tyler Bridge	Monkton

The Addison County River Watch Collaborative has been monitoring water quality in the Lewis Creek since 1992. For years 2014 through 2017, the number of sampling locations in this watershed has been reduced to two sentinel stations monitored for long-term trends: LCR3.7 and LCR14. This brief watershed summary provides results of sentinel monitoring. A special monitoring project was also conducted in the Lewis Creek watershed in 2017 to bracket known or suspected source regions of bacterial contamination upstream of the Tyler Bridge Road crossing, in support of a Total Maximum Daily Load for Bacteria-impaired waters.³ Results of this special project are provided under separate cover.

During 2017, sentinel sampling occurred on two spring dates (April 5 and May 3) and four summer dates (June 7, July 5, August 2, and September 6). The year was characterized by a wetter-than-normal spring and early summer, followed by a drier-than-normal fall. April through July and September sampling events took place during high flows, either actively rising or declining from recent rainfall and runoff, based on streamflow gaging records from a USGS streamflow gaging station located on the Lewis Creek at the Route 7 crossing. The August event occurred during moderate flows, representative of baseflow conditions (i.e., relatively stable flow stage, not significantly rising or falling in response to a rainfall event).

Samples from the Lewis Creek watershed were tested for *E.coli*, total phosphorus, and turbidity; *E.coli* was tested only on the summer dates.

Summer 2017



³ http://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/mp_bacteriatmdl.pdf

E.coli counts in the Lewis Creek at the two sentinel stations ranged from 35 to >2,420 organisms/100 mL. Vermont Water Quality Criteria (VWMD, 2016) state that *E.coli* is not to exceed a geometric mean of 126 organisms /100mL obtained over a representative period of 60 days, and no more than 10% of samples should be above 235 organisms/100 mL. *E.coli* counts exceeded the state's health-based standard of 235 organisms/100 mL on two of the four summer sample dates at each station: Tyler Bridge Rd (LCR14) and the Old Route 7 bridge (LCR3.7). The geometric mean of summer sampling results was 310 org/100mL at LCR14 and 325 org/100mL at LCR3.7; both values exceeded the state's geometric mean standard of 126 organisms/ 100 mL. Detected *E.coli* counts at this Tyler Bridge station were largely consistent with historic monitoring results which indicate chronic exceedances of the water quality standard for *E.coli*. Station LCR14 is located downstream of a dairy pasture where livestock have direct access to the stream. Beavers are also abundant in segments of the Lewis Creek and Hollow Brook tributary upstream of this station.

Turbidity levels in the Lewis Creek at the sentinel stations ranged from 2.7 to 92 NTUs for the six sample dates. The Vermont state standard of 10 NTUs (for Class B cold-water fisheries) is applicable during dry-weather, baseflow conditions which were relevant to only the August event. Detected concentrations were below the standard at both sites on this date: 2.7 NTUs (at LCR14) and 4.7 NTUs (at LCR3.7). Based on past years' sampling results, turbidity can be elevated at times of increased flow – during a summer thunderstorm, or during spring runoff conditions – especially in the lower reaches of the river. An increasing trend in turbidity with distance downstream is generally observed during all flow conditions.

Phosphorus was detected at low to high concentrations during the six Spring and Summer sampling dates, ranging from 13 to 278 µg/L. The instream phosphorus criterion of 27 µg/L for warm-water medium gradient (WWMG) wadeable stream ecotypes in Class B waters is applicable at low median monthly flow conditions during June through October. Flows in the Lewis Creek during sentinel monitoring were near the low median monthly flow during the August sample date, based on records from the USGS streamflow gage located at the Route 7 crossing. Detected concentrations of phosphorus on this date did not exceed the instream nutrient standard of 27 µg/L at either sentinel station: 13 µg/L (at LCR14) and 22 µg/L (at LCR3.7). Historic results for both sentinel and rotational sites have shown an increasing trend in phosphorus concentration with distance downstream, as well as a tendency for elevated phosphorus concentrations during high flows.

2018: An increased number of parameters and additional monitoring sites will be evaluated when a more intensive monitoring focus rotates back to the Lewis Creek for a two-year period beginning in the year 2018. As part of this focus monitoring, the Collaborative will continue with bracket monitoring at stations in vicinity of the Tyler Bridge Road crossing to gain a better understanding of water quality patterns and potential sources of elevated pathogens, nutrients and sediments in this region.

Water quality data from the previous focus period (2012-2013) are being used by VTDEC biomonitoring teams to evaluate the health of several headwaters reaches. These data will inform ongoing municipal-level discussions and basin-planning efforts regarding water quality management and classification.

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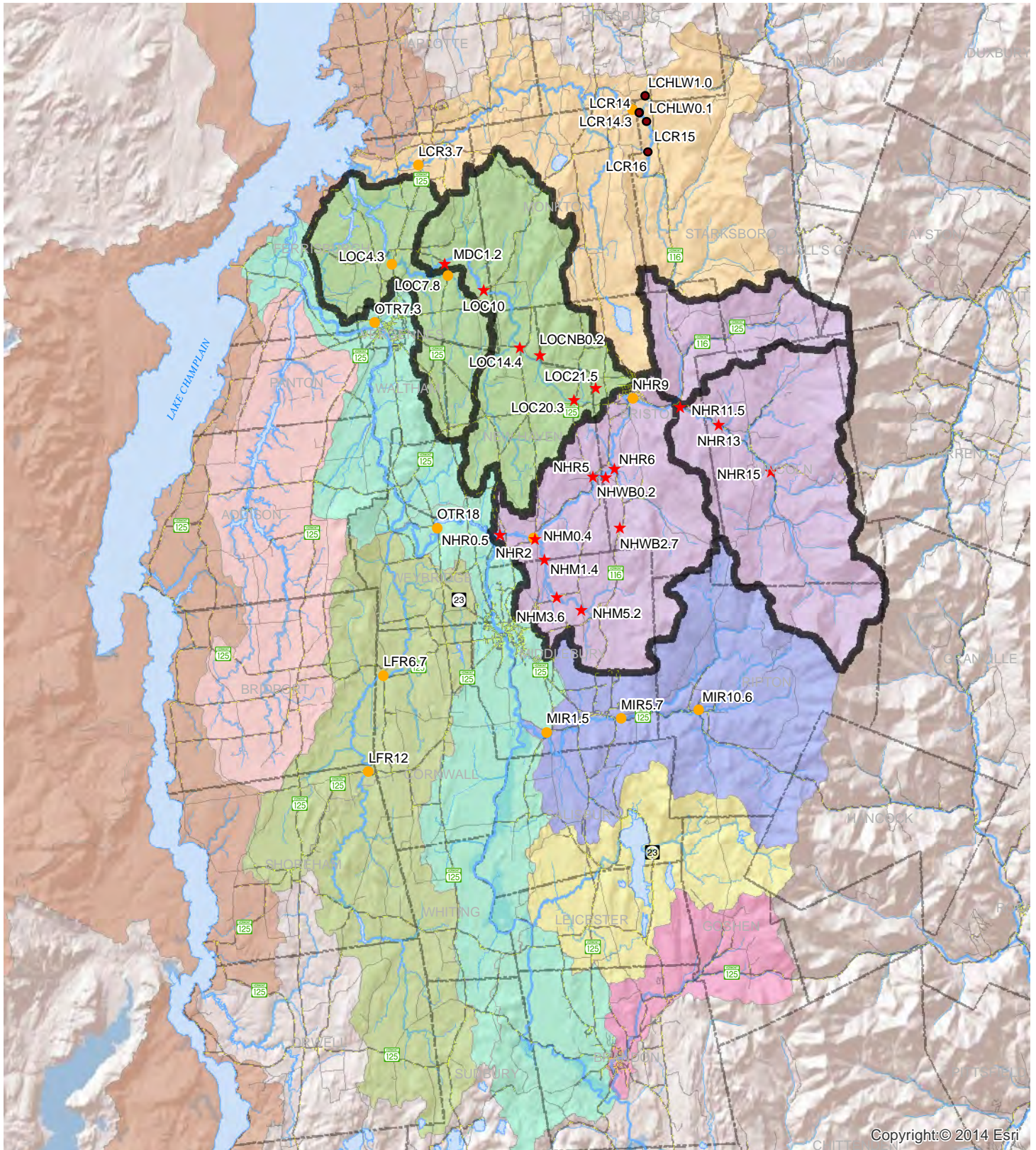
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or visit our web page at: www.acrpc.org/acrcwc

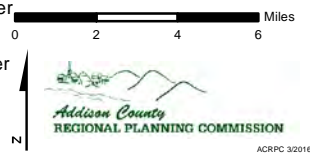
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Water Quality Monitoring Sites by Watershed, 2017



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|--|-------------------------------|--------------|-------------------------|--------------------|
| ★ Rotational Site | Rotational Basins 2017 | Roads | ■ Lake Champlain Direct | ■ Dead Creek |
| ● Sentinel Site | ■ Little Otter Creek | — Pavement | ■ Lewis Creek | ■ Lemon Fair River |
| ● Special Project Site (E.coli monitoring) | ■ New Haven River | — Gravel | ■ Little Otter Creek | ■ Leicester River |
| | | | ■ Otter Creek | ■ Middlebury River |
| | | | ■ New Haven River | ■ Neshobe River |



The Addison County River Watch Collaborative is a citizen organization that monitors and assesses the condition and use of our local rivers over the long term, raises public awareness of the values and functions of our watersheds, and cultivates partnerships that support water quality stewardship.